

A REVIEW OF THE GENUS *CATINATHRIPS*
(THYSANOPTERA: THRIPIDAE)

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Abstract.—The genus *Catinathrips* is reviewed. *Catinathrips beshearae*, new species, in leaf galls of *Calycanthus fertilis* Walt. and *C. floridus* L. and two other new species, *C. vacciniculus* and *C. similis*, which curl the leaves of blueberry, *Vaccinium* spp., are described. Identification keys are provided for the females of the five known species and males of three species.

Key Words: Thysanoptera, Thripidae, *Catinathrips*, new species

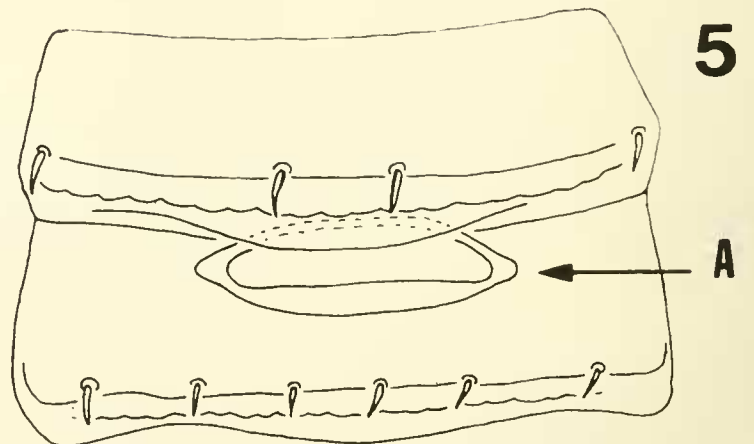
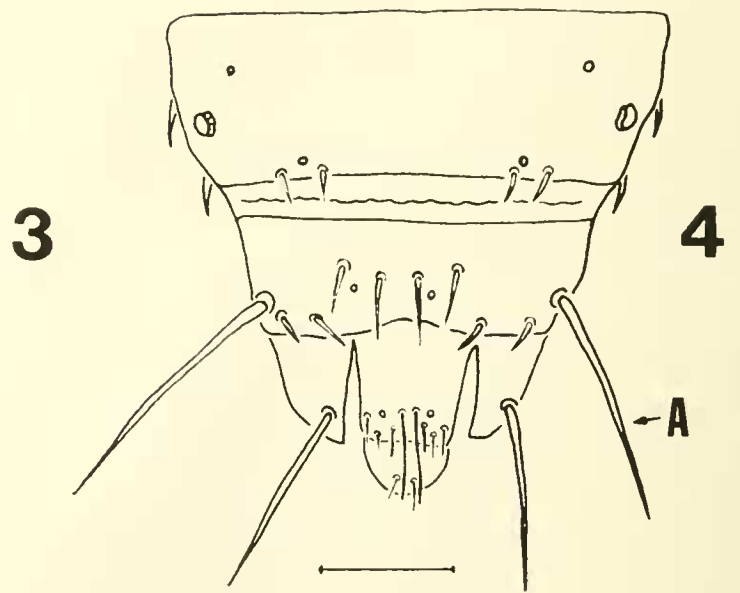
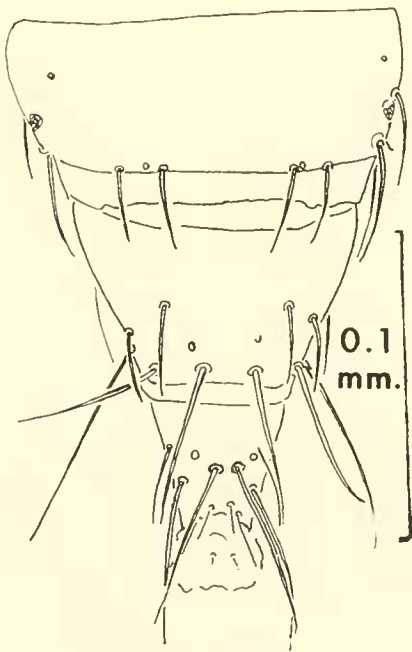
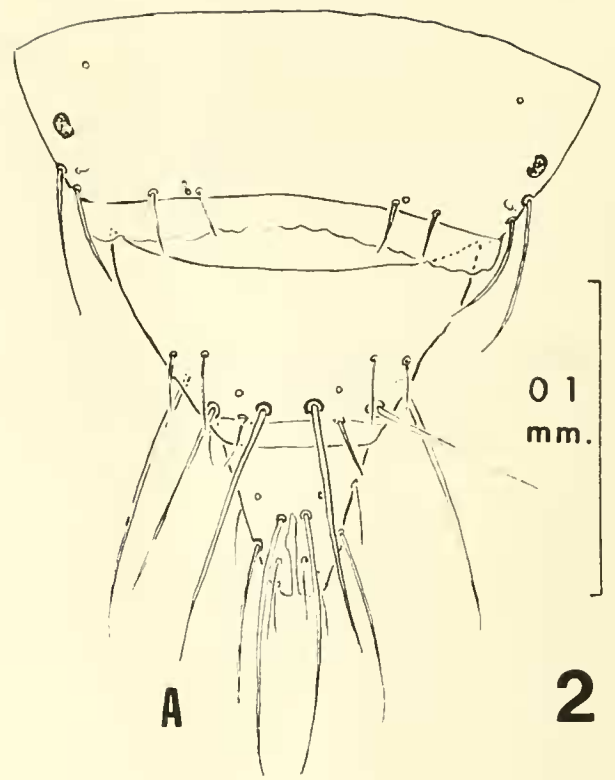
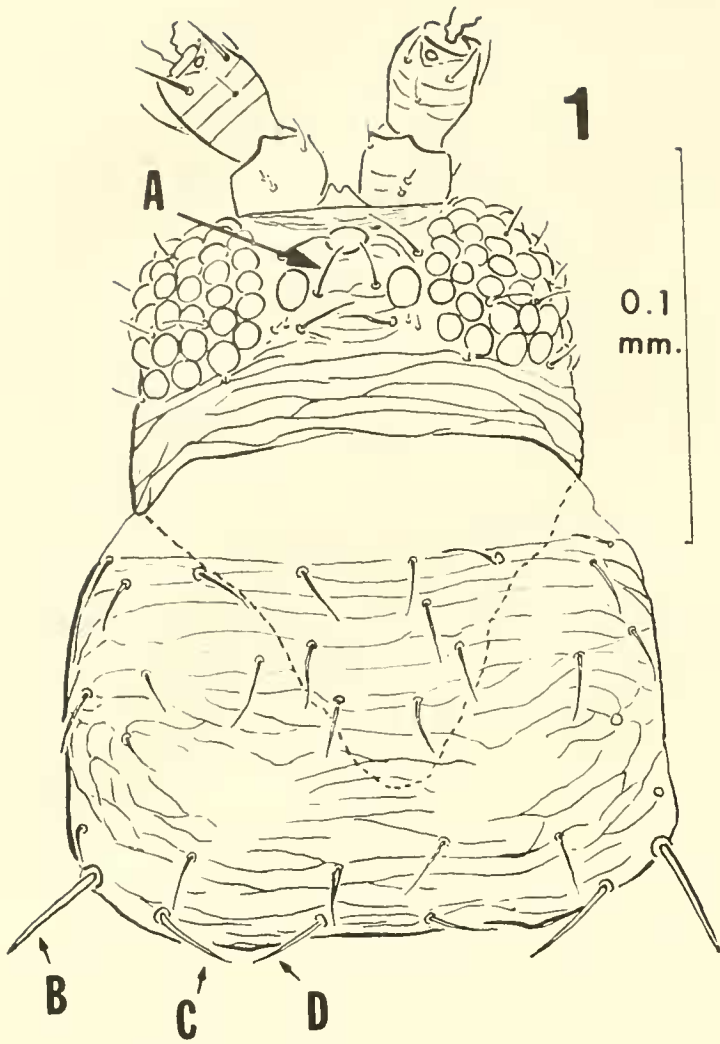
The genus *Catinathrips* known only from eastern Canada and United States consists currently of *C. kainos* O'Neill and *C. vaccinophilus* (Hood), which infest blueberry (*Vaccinium* spp.) in the northeastern United States and adjacent Canadian provinces of New Brunswick, Nova Scotia and Ontario. Two new species, *C. similis* and *C. vacciniculus*, in Florida and Georgia curl the leaves of blueberry and are described here to provide scientific names for research on blueberry insects now in progress in Georgia. Another new species, *C. beshearae*, is found in leaf galls of *Calycanthus fertilis* Walt. and *C. floridus* L. in Georgia and North Carolina and has been previously reported but misidentified. A generic redescription and synoptic descriptions of the two nominal species are presented. Measurements of all morphological characters are in microns except for the body length which is given in millimeters.

Genus *Catinathrips*

Catinathrips O'Neill, 1967: 854. Type species: *Catinathrips kainos* O'Neill by original designation.

Female: Antennae 8-segmented; segments III and IV each with a sensory trichome. Head with 2 pairs of ocellar setae, ocellar setae I absent, ocellar setae II laterad or posterolaterad of anterior ocellus near inner margin of eyes, setae III between and aligned with caudal or medial part of posterior ocelli; postocular setae small, 2-3 closely grouped just caudad of each posterior ocellus, 1 longer than other two, another posterior of eye; maxillary palpi 2- or 3-segmented. Pronotum with 2 pairs of posteroangular setae, 1 pair of posteromarginal setae; mesothoracic and metathoracic furca and spinula present. Forewings short, about 1/2 as long as distended body, anterior margin slightly concave, hindvein with few setae, distal 1/2 of forevein with irregularly spaced setae; fringe cilia straight or slightly wavy. Abdominal segments with postero-marginal flanges, those on sternites lobed between B1-B3 setae; ctenidia absent; tergite VIII with median setae and sensilla on posterior margin, sensilla near median setae, without posteromarginal comb. Sternites without accessory setae.

Male: Macropterous or brachypterous.



Color and most morphological characters similar to that of female, smaller. Abdominal tergite IX with bristle-like setae; sternite III with or without glandular area.

KEY TO SPECIES

- 1. Female 2
- Male 6
- 2(1). Maxillary palps 3-segmented; body light yellow; antennae brown except segments I-II completely pale, III pale in pedicel and extreme base, IV and V paler in extreme base; B1 setae on abdominal tergite IX about as long as tergite X *beshearae* n. sp.
- Maxillary palps 2-segmented; other characters various 3
- 3(2). Posteroangular setae $\frac{1}{5}$ - $\frac{2}{5}$ as long as pronotum (Fig. 1), less than $\frac{1}{2}$ as long as B1 setae on abdominal tergite IX (Fig. 2) 4
- Posteroangular setae about $\frac{1}{2}$ as long as pronotum, about $\frac{1}{2}$ as long as B1 setae on abdominal tergite IX or longer 5
- 4(3). Posteroangular setae about $\frac{2}{5}$ as long as B1 setae on abdominal tergite IX; medial sculpture lines on metanotum transverse, forming wide transverse reticles *kainos* O'Neill
- Posteroangular setae $\frac{1}{5}$ - $\frac{3}{10}$ as long as B1 setae on abdominal tergite IX; metanotum reticulated medially *similis* n. sp.
- 5(3). Forewings pale yellow, body light yellow; B1 setae on tergite IX 64-74 long (Fig. 3), 1.25-1.40 times as long as posteroangular setae *vaccinophilus* (Hood)
- Forewings light brown with base paler, scale brown; lateral part of mesothorax, mesonotum, metanotum and ocellar area with pale brown shade; B1 setae on abdominal tergite IX 90-100 long, about twice as long as posteroangular setae *vaccinicolus* n. sp.
- 5(1). Abdominal sternite III with oval, glandular area (Fig. 5); major lateral setae on abdominal tergite IX about twice as long as posteroangular setae on pronotum (Fig. 4); brachypterous *kainos* O'Neill
- Abdominal sternite III apparently without

- glandular area; major lateral setae on abdominal tergite IX about as long to 1.66 times as long as posteroangular setae; macropterous 7
- 7(6). Maxillary palps 2-segmented; major lateral setae on abdominal tergite IX about as long as or slightly longer than posteroangular setae; on blueberry *vaccinophilus* (Morgan)
- Maxillary palps 3-segmented; major lateral setae on abdominal tergite IX about 1.66 times longer than posteroangular setae; on *Calycanthus* sp. *beshearae* n. sp.

Catinathrips beshearae, NEW SPECIES

Catinathrips vaccinophilus (Hood): Beshear, 1985: 244 (misidentification).

Female: Body and legs light yellow, abdominal segment X light golden yellow; forewings pale with subbasal part pale yellowish brown, scale pale yellowish brown; setae pale yellow; antennae brown except antennal segments I and II pale, pedicel and base of III pale, gradually light brown distally, basal part of IV and V pale.

Antennal segment III strongly constricted near base, VIII about 1.7 times longer than VII. Head broader than long, part posterior of eyes about $\frac{1}{3}$ as long as eye; ocellar setae II posterolaterad of anterior ocellus and near mesal margin of eyes; ocellar setae III aligned with caudal margin of posterior ocelli; post-ocular setae i about as long as ocellar setae III; beak with 3-segmented maxillary palps. Pronotum with transverse sculpture lines, few, short discal setae; posteroangular setae 0.35-0.45 times as long as pronotum, about twice as long as posteromarginal setae or those of some specimens longer; medial $\frac{1}{3}$ of metanotum reticulated, laterally sculptured longitudinally. Forewings with 16-19

Figs. 1-5. Fig. 1. *Catinathrips kainos* female. Head and pronotum. A, ocellar seta III; B, posteroangular seta outer pair; C, posteroangular seta inner pair; D, posteromarginal seta. Fig. 2. *Catinathrips kainos* female. Abdominal tergites VIII-X. A, B1 seta on tergite IX. Fig. 3. *Catinathrips vaccinophilus* female. Abdominal tergites VIII-X. Fig. 4. *Catinathrips kainos* male. Abdominal tergites VIII-X. A, major lateral seta. Fig. 5. *Catinathrips kainos* male. Abdominal sternites II-III. A, glandular area on abdominal sternite III. (Figs. 1-3 are reproductions from O'Neill (1967) and Figs. 4-5 are from O'Neill and Langille (1971). Scale for figures 4 and 5 = 0.05 mm.)

costal setae, scale with 4 marginal and 1 discal setae; forevein with 2 groups of 2–3 and 3 setae each on proximal $\frac{1}{2}$ of fore vein, 3 setae in distal $\frac{1}{2}$; hind vein with 3 widely spaced setae. Abdominal tergite I with median setae longer than those on II–VII, far apart; third dorsal seta from midline on tergite VI shorter than setae laterad to it; sculpture lines absent medially from tergites IV–VIII, microtrichia on submarginal sculpture lines on tergites V–VIII; B1 setae on abdominal tergite IX about 1.2 times longer than posteroangular setae, about as long as abdominal tergite X.

Male: Macropterous; similar in color and most morphological characters as that of female, smaller; major lateral setae on abdominal segment IX about 1.66 times longer than posteroangular setae; glandular area apparently absent from abdominal sternites.

Measurements of holotype: Body length measured from interantennal process 1.06 mm. Antennae: total length 209; length of segments: I 20, II 30, III 37, IV 32, V 30, VI 35, VII 10, VIII 15. Forewing length 432, width at midlength 24. Setal lengths: posteroangular setae inner pair 44, outer pair 44; posteromarginal setae 22; B1 setae on abdominal tergite IX 52. Length of abdominal segment X 57.

Measurements of allotype: Body length about 0.82 mm. Antennae: total length 161; length of segment I 17, II 24, III 27, IV 24, V 22, VI 30, VII 5, VIII 12. Length of forewing 382. Setal lengths: posteroangular setae inner pair 35, outer pair 37; posteromarginal setae 17; major lateral setae on abdominal tergite IX 59–62.

Type material: Holotype female: Macon Co., North Carolina, *Calycanthus fertilis* Watl., VI-16-81, R. Beshear, RJB-7-82. Allotype: male, Rabun Co., Georgia, ex *Calycanthus* sp., V-29-82, R. Beshear. Paratypes: 4 females with same collection data as holotype; 9 females with same data as holotype except collected VI-1-82; 6 females, Henry Co., Georgia, *Calycanthus*

floridus L., IV-25-84, R. Beshear; 1 female, Union Co., Georgia, *Calycanthus* sp. VI-13-84, R. Beshear. Holotype deposited in the Thysanoptera collection of the U.S. National Museum of Natural History (USNM), paratypes deposited in the Department of Entomology, University of Georgia, Georgia Station, Griffin (UGG); Natural History Museum, London (NHM); Florida State Collection of Arthropods, Gainesville (FSCA); Forschungsinstitut Senckenberg, Frankfurt, Germany (FS), and USNM.

Distribution: Georgia, North Carolina.

Host: Sweet-Shrub, *Calycanthus fertilis* Walt. and *C. floridus* L.

Etymology: Named in honor of Ramona J. Beshear, the collector of the species.

Comments: The width of the forewing of the allotype is not given because the wing is slightly twisted. This species is readily distinguished by having maxillary palps with 3 segments instead of 2 present in the other species.

It was incorrectly reported as *C. vaccinophilus* by Beshear (1985) based on a misidentification that I provided her. It induces leaf galls by curling the margins of the leaves.

Catinathrips kainos O'Neill

(Figs. 1–2, 4–5)

Taeniothrips vaccinophilus Hood: O'Neill and Bigelow, 1964: 1228 (misidentification).

Catinathrips kainos O'Neill, 1967: 856; O'Neill & Langille, 1971: 752; Langille & Forsythe, 1972: 1781; Chaisson, 1986: 58.

Female: body pale with orange-yellow internal pigmentation, lateral part of mesothorax and often pronotum, abdominal segment I, sides of II–VII shaded light brown; ocellar crescent orange; antennae light brown except I pale, II pale brown, III with proximal $\frac{2}{3}$ paler than brown distal $\frac{1}{3}$, bases of IV–V pale, VIII brownish yellow; forewings pale with brown shade in basal $\frac{1}{3}$ or shaded pale brown with base pale.

Body length about 1.2 mm. Mouthcone

with 2-segmented maxillary palps. Pronotum with discal setae $\frac{1}{2}$ – $\frac{3}{4}$ as long as posteroangular setae; posteroangular setae 27–42 (Fig. 1), $\frac{1}{4}$ – $\frac{2}{5}$ as long as pronotum, less than $\frac{1}{2}$ as long as B1 setae on abdominal segment IX, inner pair pointed medially; posteromarginal setae $\frac{1}{2}$ to about as long as posteroangular setae, pointed laterally; B1 setae on abdominal tergite IX 84–96 (Fig. 2). Metanotum with medial sculpture lines transverse, forming wide transverse reticles; median setae near anterior margin, about 7 from margin. Third dorsal seta from midline on abdominal tergite VI shorter than two setae laterad to it. Length of abdominal tergite X 62–64.

Male: Brachypterous; similar to female in color and most morphological characters, smaller; tergite IX with major lateral setae 80–90 long (Fig. 4), about twice as long as posteroangular setae; transverse, oval glandular area on sternite III about $\frac{1}{2}$ as wide as sternite (Fig. 5), absent from other sternites.

Distribution: Canada (New Brunswick, Nova Scotia, Ontario), United States (Massachusetts, Maine).

Hosts: *Vaccinium angustifolium* (Aiton.), *Vaccinium* sp.

Comments: *Catinathrips kainos* closely resembles *C. similis* but differs by having a brownish yellow antennal segment VIII, longer setae on the pronotum, the sculpturing on the metanotum forming wide transverse reticles medially, and the third dorsal seta on abdominal tergite VI is shorter than the two setae laterad to it; whereas *C. similis* has a brown antennal segment VIII, smaller reticulations on the metanotum and the third dorsal seta on abdominal segment VI is about as long as the two setae laterad to it.

Catinathrips kainos has been confused with two other species, *Frankliniella vaccinii* Morgan and *C. vaccinophilus* (Hood) (previously placed in *Taeniothrips*), which are commonly found on blueberry. In the Maritime Provinces of Canada and New England States, the thrips infesting low-bush

blueberry were identified as *F. vaccinii* for many years (Phipps 1930, Lathrop 1942, Wood 1956) until Wood (1960) reported that *C. vaccinophilus*, described from New York State, was also present in New Brunswick and Nova Scotia. He further stated that *C. vaccinophilus* migrated into New Brunswick from the New England States in or about 1951 and had become the predominant species on low-bush blueberry. Based on material from Massachusetts, Maine and New Brunswick, O'Neill (1967) described a new species, *kainos*, which was assigned with *vaccinophilus* to a new genus *Catinathrips*. O'Neill also treated the reports of *C. vaccinophilus* in Wood (1960) and O'Neill and Bigelow (1964) as misidentifications of *C. kainos*. The only material I have seen of *C. vaccinophilus* is the types from New York State and a lot each from New Jersey and Pennsylvania.

Catinathrips kainos caused galls by curling the leaves and damaged low-bush blueberry in New Brunswick (Wood 1960). According to Langille and Forsythe (1972), *C. kainos* is univoltine and overwinters as adults in the soil in Maine. The adults appeared in mid to late May on low-bush blueberry and were very abundant by mid June. By mid July they were at low level and were absent in August. The eggs were laid in leaf galls, and the larvae, which were present by mid June in leaf galls, migrated to the soil in late July. Although only a few males were observed in early June on blueberry, more males were found in soil samples. A nematode, *Howardula aptini* (Sharga), parasitized *C. vaccinophilus* (reported as *Taeniothrips vaccinophilus*) in New Brunswick (Nickle and Wood 1964).

Catinathrips similis, NEW SPECIES

Females: Body generally yellow, shaded brown in ocellar area of head, posterior part of pronotum, mesonotum, lateral part of mesothorax and metanotum, and posterior $\frac{1}{2}$ of abdominal tergites with pale brown tinge; forewings light brown with bases paler

brown, scale brown; antennae brown except I paler than head, II yellowish brown, basal parts of III–V lighter than distally.

Head wider than long, eyes about $\frac{2}{3}$ as long as head; ocellar setae II laterad or posterolaterad of anterior ocellus, near inner margin of eyes; ocellar setae III between posterior ocellus (cf. Fig. 1); postocular setae I about as long as ocellar setae III; mouthcone with 2-segmented maxillary palps. Pronotum with transverse sculpture lines, discal setae few, $\frac{3}{4}$ to as long as posteroangular setae; posteroangular setae $\frac{1}{5}$ – $\frac{1}{4}$ as long as pronotum and about $\frac{1}{5}$ – $\frac{3}{10}$ as long as B1 setae on abdominal tergite IX, inner pair pointed medially; posteromarginal setae short, pointed laterally, $\frac{1}{2}$ to as long as posteroangular setae. Metanotum completely reticulated, median setae about 12 from anterior margin of notum. Forewing with 18 costal setae; proximal $\frac{1}{2}$ of forevein with two groups of 3 setae, distal $\frac{1}{2}$ with 3 distal setae; hindvein with 3 setae. Abdominal tergite I with median setae longer than those on tergites II–VI; third dorsal seta from midline on tergite VI well developed, as large as two setae laterad to it; sculpture lines absent medially from tergites IV–VIII, short microtrichia on submarginal sculpture lines on tergites VII–VIII.

Male: Unknown.

Measurements of holotype: Body length 1.27 mm (distended). Length of antennae: Total length: 199; length of segment I 20, II 30, III 40, IV 32, V 27, VI 35, VII 7, VIII 15. Forewing length 521, width at mid-length 24. Setal lengths: posteroangular setae inner pair 22, outer pair 17–20; posteromarginal setae 17–24; B1 setae on abdominal tergite IX 99. Length of abdominal tergite X 62.

Type material: Holotype female labeled: Columbia Co., Florida, *V. myrsinites* (Lam.) galls, 4-IV-89, R. Beshear (USNM). Paratypes: 5 females with same data as holotype; 2 females, Centerville, Georgia, *V. tenellum* Aiton. curled leaves, 14-IV-89, A. Amis

(JP 11059, RJB-37-89). Paratypes in UGG and USNM.

Etymology: Specific epithet derived from Latin “similis.” This species closely resembles *C. kainos*.

Distribution: United States (Florida, Georgia).

Hosts: *Vaccinium myrsinites* (Lam.), *V. tenellum* Aiton.

Comments: This species closely resembles *C. kainos*. The morphological differences are discussed in the comments for *kainos*.

Catinathrips similis curls the leaves of blueberry and is a minor pest of wild plants.

Catinathrips vaccinophilus, NEW SPECIES

Female: Body yellow except shaded light yellowish brown in ocellar area, mesonotum and lateral part of mesothorax, metanotum and lateral part of metathorax, abdominal tergite I; legs yellow; ocellar crescent orange; setae brownish yellow; forewings light brown with base pale, scale light brown; antennae brown except I–II pale, pedicel and base of III pale, gradually light brown distally, bases of IV–V pale, VIII light brown or yellow distally.

Antennal segment III constricted near base; head wider than long, part posterior of eyes about $\frac{1}{3}$ as long as eye; ocellar setae II laterad of small anterior ocellus; ocellar setae III between posterior ocelli and slightly anterior to caudal margin of posterior ocelli; postocular seta I about as long as ocellar setae III; mouthcone with 2-segmented maxillary palps. Pronotum with transverse sculpture lines, discal setae $\frac{1}{3}$ – $\frac{2}{5}$ as long as posteroangular setae; posteroangular setae about $\frac{1}{2}$ as long as pronotum, more than twice as long as posteromarginal setae, about $\frac{1}{2}$ as long as B1 setae on abdominal tergite IX; inner posteroangular setae pointed posteriorly. Metanotum reticulated; median pair of setae positioned in

anterior $\frac{1}{3}$ to $\frac{2}{5}$ of notum. Forewings with 18 costal setae; proximal $\frac{1}{2}$ of forevein with two groups of 3 and 2–3 setae, distal $\frac{1}{2}$ with 3 distal setae; 3 setae on hindvein; scale with 4 marginal and 1 discal setae. Abdominal tergite I with median setae larger than median setae on tergites II–VI; third dorsal seta from midline on tergite VI about as large as two setae laterad to it; medial sculpture lines absent from tergites V–VIII; few microtrichia on submarginal sculpture lines on tergite VIII, 1–2 indistinct dentate ones usually on VII; B1 setae on tergite IX about twice as long as posteroangular setae, about 1.6 to twice as long as tergite X.

Male: Unknown.

Measurements of holotype: Body length measured from interantennal process of head 1.02 mm. Antennae: total length 216; length of segment I 20, II 30; III 40, IV 35, V 30, VI 37, VII 7, VIII 17. Forewing length 432, width at midlength 27 (based on a paratype). Setal lengths: posteroangular inner pair 47, outer pair 47; posteromarginal setae 17; B1 setae on abdominal tergite IX 94. Length of abdominal tergite X 59.

Type material: Holotype female labeled: Peach Co., site #1 Reade, *Vaccinium arboreum* Marshall, 7-VII-89, J. A. Payne (JP 11261) (USNM). Paratypes: 1 female with same data as holotype; 3 females, Peach Co., Georgia, *V. arboreum* (curl-leaves), 3-IV-89, J. A. Payne (JP 11053); 11 females, Peach Co., Georgia, *V. arboreum* (curl-leaves), 3-IV-89, J. A. Payne (JP 11058); 12 females, Peach Co., Georgia, *V. arboreum* leaf curls, 16-IV-89, J. Payne (JP 11060); 1 female, Peach Co., Georgia, *Vaccinium arboreum* curled leaves, 28-IV-89 (JP 11062); 2 females, Peach Co., Georgia, *V. arboreum* leaf curls, 5-V-89, J. A. Payne (JP 11064); 1 female, Peach Co., Georgia, *V. arboreum*, 4-IX-89, J. A. Payne (JP 11272); 1 female, Peach Co., Georgia, *V. arboreum*, 16-IX-89, J. A. Payne (JP 11273); 1 female, Peach Co., Georgia, *V. arboreum*, 3-X-89, J. A. Payne (JP 11274). Paratypes deposited FS,

FSCA, Illinois Natural History Survey, NHM, UGG, USNM.

Etymology: Specific epithet is a combination of the host, *Vaccinium*, and Latin “cola” (= inhabitant). This species is found only on *Vaccinium*.

Distribution: Georgia.

Hosts: *Vaccinium arboreum* Marshall.

Comments: This species closely resembles *C. vaccinophilus*, but differs by having pale brown coloration on the body and forewings. The body and forewings of *C. vaccinophilus* are light or pale yellow.

This species curls the leaves of blueberry and is considered a pest of wild, high-bush blueberries in Georgia.

Catinathrips vaccinophilus (Hood)

(Fig. 3)

Taeniothrips vaccinophilus Hood, 1936a: 1; Wood, 1969: 757; O'Neill and Bigelow, 1964: 1228; Stannard, 1968: 363.

Catinathrips vaccinophilus: O'Neill, 1967: 856; O'Neill & Langille, 1971: 752.

Female: Body pale yellow. Antennae I–II completely pale; III pale except for light brown apex; basal $\frac{1}{3}$ – $\frac{1}{2}$ of IV–V pale, distally light brown; VI pale basally, light brown distally; and VII–VIII light brown, distal part of VIII usually paler. Forewings pale yellow.

Body length 0.88–1.0 mm. Mouthcone with 2-segmented maxillary palps. Pronotum with discal setae less than $\frac{1}{2}$ as long as posteroangular setae; posteroangular setae 45–60, about $\frac{1}{2}$ as long as pronotum, twice as long as posteromarginal setae, inner pair pointed posteriorly; metanotum reticulated medially, pair of median setae positioned in anterior $\frac{1}{5}$ to $\frac{1}{4}$ of notum; third dorsal seta from midline on abdominal tergite VI often decidedly shorter than two setae laterad to it. Tergite IX (Fig. 3) with B1 setae 64–74, 1.25–1.40 times longer than posteroangular setae. Length of abdominal tergite X 50–52.

Male: Similar in color and most mor-

phological characters to females but smaller; macropterous; major lateral setae on abdominal tergite IX 40–55 long, about as long or slightly longer than posteroangular setae on pronotum; abdominal sternites apparently without glandular area.

Distribution: United States (Connecticut, District of Columbia, New Jersey, New York, Pennsylvania).

Hosts: *Smilacina* sp. (false solomon's seal), *Vaccinium* sp., *V. stamineum* L.

Comments: The distribution records for Connecticut and District of Columbia are from Stannard (1968) and these specimens were not examined. The adults from New Jersey, New York and Pennsylvania were collected in early May to mid June.

There is no report of this species causing leaf galls on blueberry. *Smilacina* probably is an incidental host.

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